CURRENCY CHANGES AND MANAGEMENT CONTROL: A NOTE ON THE INTEGRATION OF THE INTERNATIONAL CONTROLLER'S AND TREASURER'S FUNCTIONS

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Donald R. Lessard
Peter Lorange

Management control systems are developed to facilitate decentralized decision-making while maintaining substantial goal congruence between the decentralized units and the corporation as a whole. For the multinational corporation, an international economy characterized by rapid currency changes may introduce a serious element of distortion into its control system. Unless systematically accounted for, currency changes may alter a foreign unit's reported performance and lead to decision-making not congruent with corporate objectives.

Our purpose in this note is to outline the basic elements of a control system which will communicate, measure, and motivate operating results consistent with home currency performance assuming optimal international funds management. We will show that the nature of the control function in a decentralized organization coupled with the advantages of centralized international funds management mandates a separation of the two functions. Even so, extreme care must be taken so that the two activities will be consistent with overall optimization.

Outline of Note

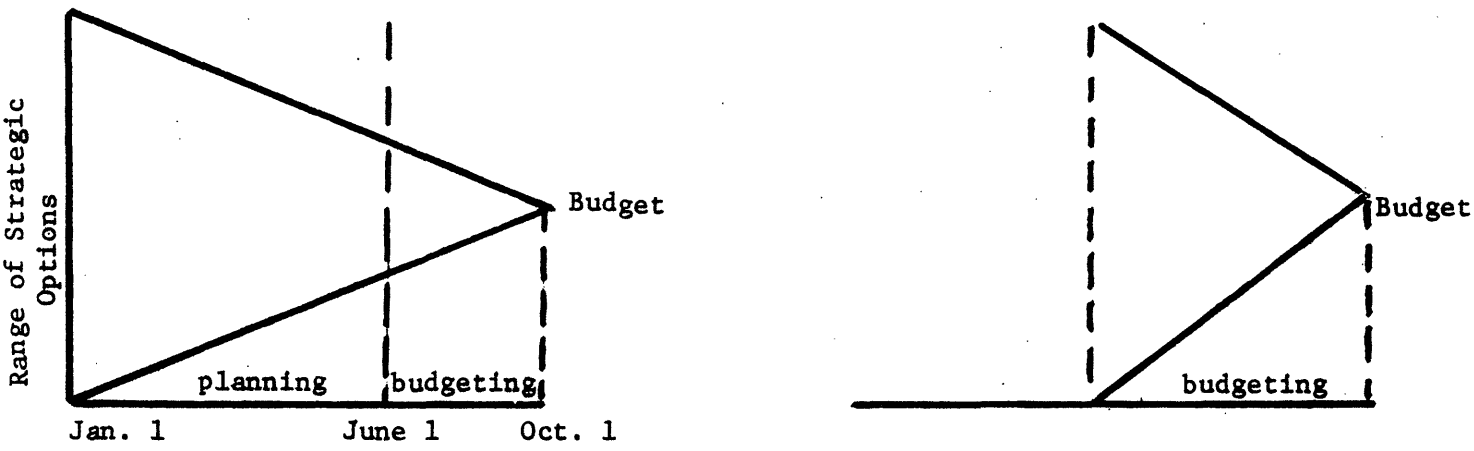
First we will give brief descriptions of some major characteristics of the management control process and the financial management process and will specifically discuss the international funds management task as part of the latter process. After this we will propose a relationship between the financial management and planning and control processes and develop a scheme which allows for decentralized control but centralized international funds management. The "linking pin" in this system is a set of specified "smart" budgeting rates. We shall then discuss some problems and procedures for setting "smart" budgeting rates; look further into how to use budgeting rates in the management control process; and, finally, illustrate our approach by means of a numerical example.

The Management Control Process

We have separated the management control process into two subprocesses.

1. determining a short-term strategy-set to be reflected in the budget.
2. tracking and diagnosing performance via reports indicating deviations from the budget and the reasons for the deviations.

Determining The Budget: The budget determination process involves making choices from a large number of business options that relate to operating decisions in order to arrive at the best strategy for these decisions (sales related decisions, resources related decisions, financial decisions, etc.). Many business units attempt to initiate the narrowing down of these options in a systematic way through long-range planning. The budget determination process then narrows the options further into one best budget. Other companies may not attempt to narrow their options through a formal planning system, either because such a system is non-existent or because the system is not (yet) entrusted with this task. In such instances the burden of narrowing the options will fall entirely on the budgeting process. These two approaches to narrowing the options, through planning and budgeting vs. budgeting alone, are shown in Figure 1:



a) Planning and Budgeting

b) Budgeting Only

Figure 1: Narrowing Strategic Option Through Planning and Budgeting vs Budgeting Only

Tracking Performance: We turn to a discussion of some of the features of the second part of the control process, namely the tracking and diagnosing of actual performance relative to the budget. At predetermined intervals measures are taken of the degree of fulfillment of the budgeted targets for each of the key operating variables. Deviations from budgeted targets may lead the control system to trigger one of three types of corrective actions:

- take no current action, but analyze the sources of the deviation to provide added insight for next year's plan;
- correct the budgeted operating actions;
- or (particularly in cases of deviations due to fundamental changes in assumptions included in the long-range plan) change the plan itself and, consequently, also change the budget.

Assumptions

In this note we make several assumptions. We assume first that a formal planning system exists and that there is consistency between the planning and control systems.[1] Also, although a budget may be expressed in terms of mixed numbers (i.e. not only in $ terms but also as non-$ figures as well as qualitative statements), we shall restrict ourselves to $ numbers. We assume that control process will be hierarchical reflecting several organizational levels. This assumption results in a requirement for some form of hierarchical and perhaps horizontal decomposition in order to fit together with pieces of the control process. However, we shall not explore the development of a complete control system in detail, but merely discuss the control of a foreign responsibility center relative to the domestic corporate headquarters. The principles of control to be proposed can be put forward more effectively within this simplified framework.

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[1] See Vancil and Lorange [13], Lorange and Scott Morton [6] for a discussion of how to develop integrated planning and control systems.

This general discussion of the control process thus far assumes that no currency fluctuation problems exist. For the multinational corporation, however, it is evident that operating decisions leading to a "smart" budget as well as the tracking measurement of actual performance relative to the budget will be influenced by currency considerations. We propose that control of the international operations can be carried out in a way similar to the one described above, provided the international funds management dimension is controlled centrally and is reflected acurately in a set of planning rates.

The Financial Management Process

Operating parallel to the management-control process described is a financial management process concerned with investment and long and short-term financing decisions. It also emerges from the long-term planning process and, as we shall see below, it interacts with the management control process at a number of points.

The financial management process can be separated into long and short-range components depending on the frequency with which decisions are reevaluated. In the long-range component, strategic planning determines basic business activities which, in turn, call for certain investment and financing actions. In some cases, this investment and financing decision process feeds back into strategic planning in order to iteratively improve the total plan. In the multinational firm, this stage is complicated by the need to determine the best possible international allocation of revenues and costs from the viewpoint of tax minimization. This tax/profit planning process involves the transfer of profits among units to reduce or postpone taxes by manipulating transfer, prices shifting the location of high margin activities, shifting the incidence of fees and overheads, and by allocating the burden of financing worldwide operations through intracompany accounts. This long-range component, including tax and profit planning, will be undertaken annually, or when major changes occur in the environment.

The short-range component includes the management of cash and liquid assets and short-term financing common to domestic and multinational firms as well as foreign exchange management. We shall refer to this set of activities as funds management. The decisions it entails are reconsidered frequently in accordance with changes in the firms operations as well as in the environment.

Although some of the variables in the tax and profit planning process also appear in the funds management process, the two processes can be differentiated by the reversibility of the actions. For example, transfer prices do shift profits and cash, but since it is unlikely that these can be varied frequently due to operational or external constraints it becomes part of tax and profit planning. Similarly, basic intracompany financing and remittance policies are part of the longer range planning process, although the precise timing of the funds flows can be adjusted and therefore included in the funds management process.

Assuming that the long-term planning activities are being solved appropriately and that this is reflected in optimal transfer prices and after-tax financing costs, the funds management problem is to minimize the expected cost of financing the cash budget over the relevant planning period or maximize profit for a given set of operating decisions given interest rate and exchange rate forecasts and certain constraints on foreign exchange risk exposure or, in more sophisticated formulations, to define efficient risk-cost solutions.[2,3]

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[2] Examples of formal solutions to the funds management problem include Lietaer [5], Rutenberg [8], and Shapiro [10]. Scott [9] provides a concise description of the key elements in this process.

[3] Shulman [11] discusses operational constraints on transfer price manipulation. These constraints coupled with restrictions imposed by tax authorities suggest to us that transfer price manipulation should be considered part of the long-range tax/profit planning process and not part of the short-term funds management process as suggested by Rutenberg.

The primary solution variables are borrowing or lending in different currencies for periods of the same or different maturities, shifting funds through leading or lagging intracompany payables, timing funds remittances, and entering into forward exchange contracts. In addition to the cash budget and forecasts of interest and exchange rates, information will be required on external constraints limiting specific transactions (i.e. maximum acceleration of spot foreign exchange transfers due to leading and lagging intracompnay accounts, maximum borrowing in different currencies and markets, etc.) which in turn may be linked to certain company variables. If risk aversion is introduced into the problem, further information about the firm's operations, monetary assets and liabilities, and investment opportunities is required. In order to solve the funds management problem so as to hedge against exchange fluctuations, the impact of these fluctuations on the value of the firm must be estimated and incorporated in the solution procedure.[4]

Whether the funds management function seeks to profit from international capital market imperfections, such as nationally segmented markets separated by restrictions on certain types of capital transactions, or whether it merely seeks to limit risks due to exchange rate fluctuations, it should be readily apparent that maximum effectiveness requires treating the entire multinational corporation as a single unit.[5]

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[4] It is interesting to note that the funds management function makes no distinction between "normal" financing, hedging, or speculation. For example, taking advantage of interest differentials in the financing of total corporate cash needs might be viewed as "normal" financing, whereas further borrowing in one currency for lending in another would be speculation. Typical solution procedures would not distinguish between the two and would exploit international disequilibria to the extent allowed by internal or external constraints. For example, the model employed by Robbins and Stobaugh [7], makes no distinctions of this type.

[5] Robbins and Stobaugh [7] provide extensive examples and analyses supporting this statement although they find that the largest corporations have backed off from complete centralization of this function. This may be due to the difficulties of coordinating it with the management control process.

The Relationship Between The Control And Financial Management Process

Up to this point we have proceeded as if the control and financial management processes are parallel, but essentially independent. However, it should be readily apparent that there are a number of interdependencies between the two. In particular, operating decisions, which require assigning values to different currencies to be received or paid out at different points in time, must be linked very closely to the funds management process which determines these values. Further, the operating plans themselves should take into account likely movements in the relative values of different currencies. Limiting our discussion to the current or tactical aspects of the two processes, it should be clear that,ideally, operating decisions (selling, pricing, setting sales terms, etc.) should be made simultaneously with funds management decisions. The solution to the funds management problem determines the value of additional revenues or costs in various currencies at different points in time.[6] On the other hand, its solution requires as an input a complete schedule of receipts and expenditures which are the results of the operating decisions. This simultaneous process is illustrated in Figure 2.

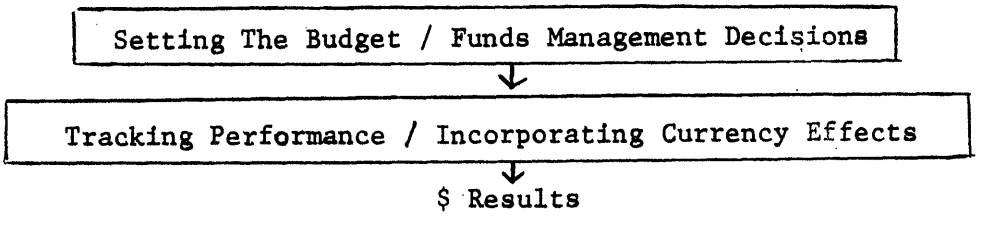

Figure 2: A Simultaneous System For Carrying Out The Financial Management As Well As The Planning and Control Tasks

6 Jääskeläinen and Salmi [4] provide a joint linear programming solution of the two in a single two country, one product context.

Unfortunately, this type of system requires operating managers to consider the entire range of financial transactions which would determine the value of the marginal foreign currency transaction. This implies that a centralized decision-making office should exist and be responsible for deciding on these two classes of problems simultaneously. However, for valid operating reasons, most real-world multinational corporations are highly decentralized; and they must, therefore, rely on mechanisms for decentralized decision-making. We wish to provide a system which separates these two functions and yet comes close to an overall optimum. A decomposed system might appear as follows:

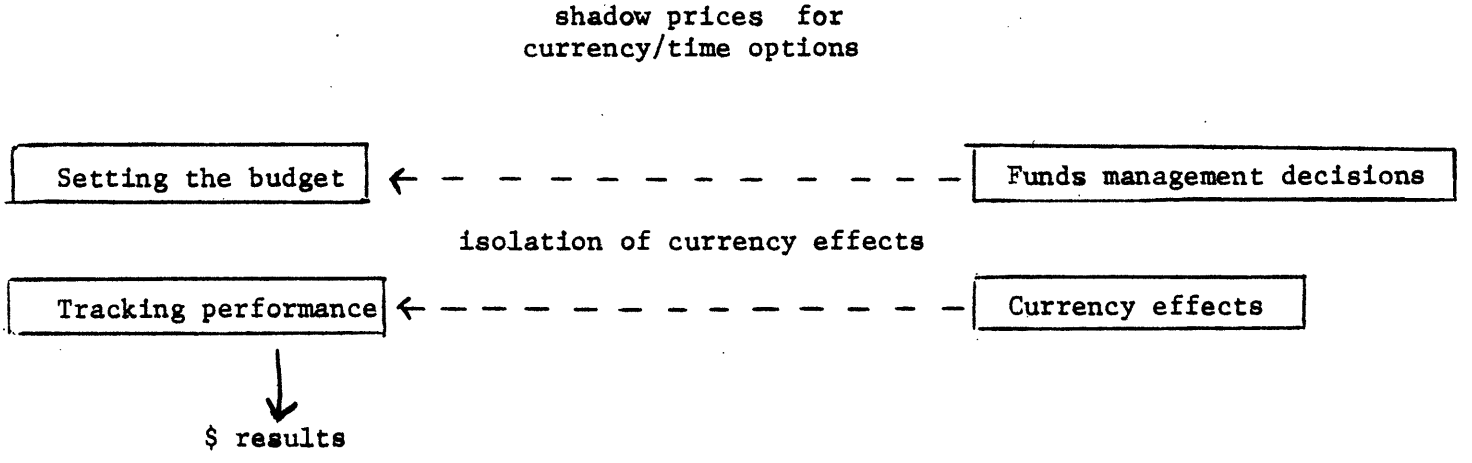

Figure 3: A Decomposed System For Carrying Out The Financial Management As Well As The Planning And Control Tasks

In Figure 4 we illustrate a process model integrating the planning and control processes with the financial management processes and indicate how the steps of the two processes might interact. This separation is very similar to what actually occurs in firms with sophisticated domestic short-term funds management frameworks. Although the Treasurer's office may engage in numerous alternative financing operations, operating managers can be provided with a single time-value figure (discount rate) relating cash flows occurring at different points in time. Note the (?) on the arrow linking funds management to operating plans as well as on the one linking funds management and current operating decisions. They reflect the lack, in practice, of such linkages, linkages which we feel are extremely important when attempting to employ a system featuring decentralized control and centralized funds management.

The problem, then, in order to allow for a decentralized planning and control process, is to define a set of shadow prices for flows in various currencies at different points in time which will provide links at these critical points. We shall refer to these rates as "smart" budgeting rates.

Determining And Using "Smart" Budgeting Rates In The Control Process

The desired set of rates will reflect the firm's estimates of exchange rates and interest rates, its receipts and disbursements over time, and its ability to shift funds from one currency to another. The difficulty,of course, lies in the requirement for a schedule of receipts and disbursements prior to their determination that reflects the simultaneous nature of the problem. This problem might be resolved by formally decomposing the overall problem as part of a mathematical programming approach. However, we consider the most realistic method to be the use of one or more iterations between the two related problems.

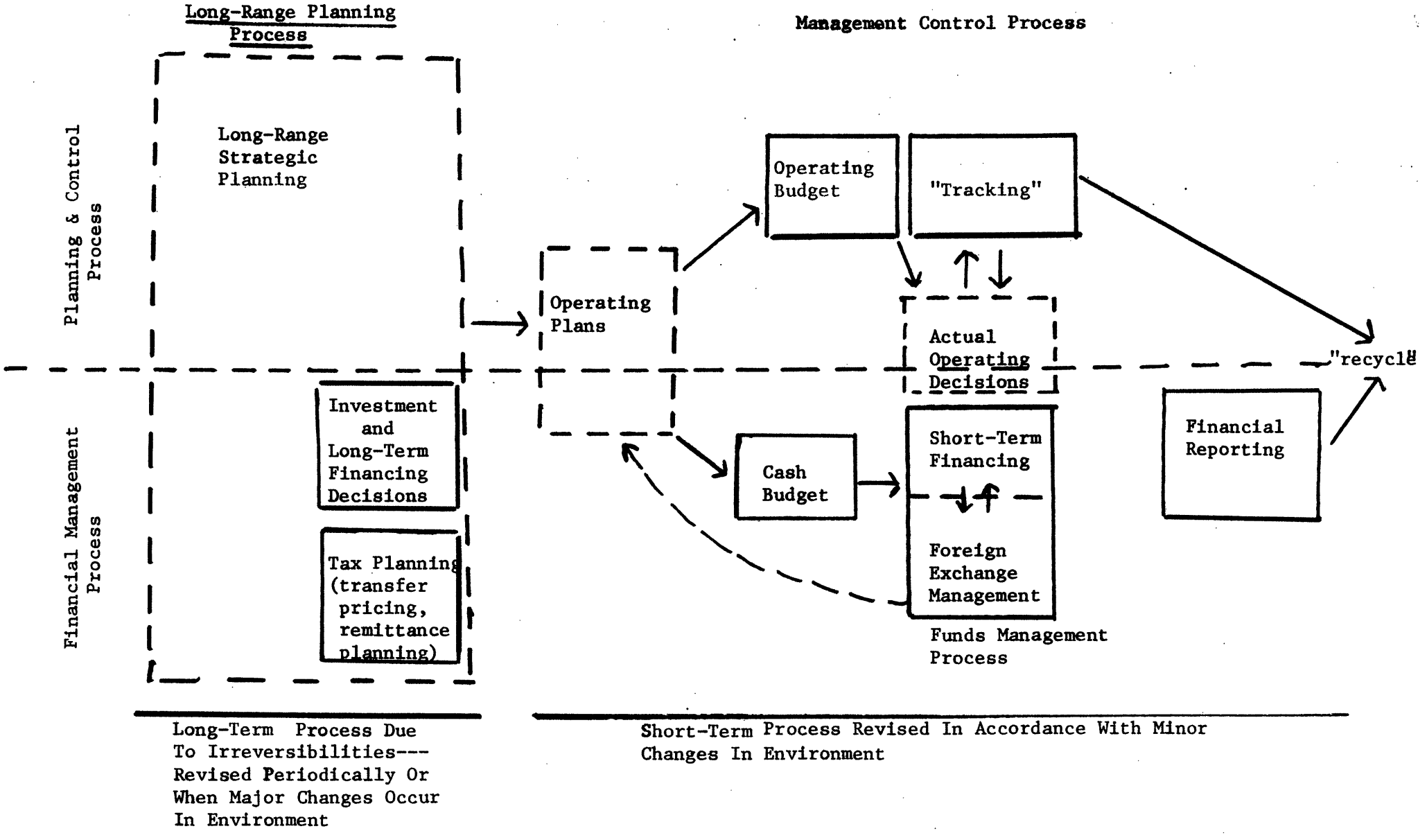

Figure 4: A Process Model Integrating Planning And Control With Financial Management

Beginning with a set of forecasts of trends in the value of various currencies relative to the central currency, operating managers could prepare rough, highly aggregated sets of operating plans for different units. These, in turn, would serve as input for a first solution of the centralized funds management problem. The resulting budgeting rates or foreign exchange future shadow rates could, in turn, be used to produce a final set of operating plans and budgeting rates to guide subsequent decisions. Only in extreme cases should further iterations be required.

In the case of firms willing to operate in terms of expected results, the budgeting rates would primarily reflect expected rates of change in foreign exchange rates over time. Budgeting rates for firms wishing to hedge against exchange rate risks would incorporate additional discounts or premiums relative to the expected future values of the various currencies.

These two alternative approaches to determining budgeting rates are illustrated with a simple example. Assume that the current exchange rate between the foreign local currency (LC) and the home currency is .1 to 1 and that there are two equally likely possibilities for the next period, .0833 to 1, and the same rate, .1 to 1, giving an expected rate of .09167 to 1.[7] Further, assume that there is a forward foreign exchange market and the one period forward rate is .09 to 1. If the firm requires no risk-premium for bearing foreign exchange fluctuations, then the expected rate of .09167 to 1 will be the appropriate "smart" rate. On the other hand, depending on its degree of risk aversion, which would undoubtedly be related to the magnitude of the impact of fluctuations of the LC:$ exchange rate on the firm, the rate would be closer to the "locked-in" or certain future rate provided by the forward contract.

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[7] All computations are done in terms of the LC:$ rate since it is the ratio used to translate results into $.

In reality, the firm might not be able to cover exchange risks fully through forward markets but would have other channels open to it, including LC borrowing. Again, constraints on aggregate foreign exchange risk exposure or a formal set of risk-cost tradeoffs would determine the position of the budgeting rate on the continuum between the expected future exchange rate and the "locked-in" certain rates provided by forward exchange contracts or local borrowing.

Of course, the problem of forecasting exchange rates still remains. But such forecasts are required for optimal operating and financial decisions regardless of the type of control process employed and, therefore, they are not an incremental requirement of the proposed system.

Because the set of "smart" budgeting rates incorporates the firm's best estimates of the value to the firm of future flows in various currencies, they are the best possible basis for operating decisions as well as the ideal benchmark for use in the control process. Furthermore, they go a long way toward resolving one of the major problems in multinational management control; the treatment of variations in measured results due to currency fluctuations.

To impose the entire effect of exchange rate fluctuations on operating managers implies responsibility without control and introduces noise into the control system. On the other hand, to entirely remove these effects surely can lead to inappropriate operating decisions since managers are not penalized for ignoring foreseeable exchange rate shifts. With appropriate budgeting rates, managers could be responsible for home currency performance computed at the budgeting rates, thus motivating appropriate decisions while not introducing uncertainty that can be dealt with better in the centralized finance function.

This system of going through a prior best judgement activity to set the "smart" currency rate for a given point in the future which then will be the basis for decision-making and performance evaluation satisfies the two major criteria for a good management control system, goal-congruence and fairness. Goal congruence is restored because a corporate-wide point of view has been brought to bear on the local currency rate, eliminating decision-making efforts taken on the basis of the expectations and risk-preferences of local managers who necessarily will have a narrower horizon on the currency risk problem than the corporate headquarters. Fairness is restored because of the establishment of a reasonably objective standard against which performance might be measured, so that the local decision-maker gets no blame or credit for currency fluctuations totally outside his control. A common source of friction today is the imposition from corporate headquarters on a subsidiary of financial policies which result from a world-wide funds management process. To the extent that the relative performance of subsidiaries is altered by these policies, they represent a major source of bias and friction in the control process. The present system ties performance evaluation to the "smart" budget rate and thus separates operating results from the centralized funds management function.[8]

A Practical Illustration

In order to illustrate the effects of alternative treatments of currency fluctuations in terms of providing signals and incentives for operating managers, we assume a possible devaluation of the local currency of the subsidiary relative to the home currency of the parent with possible outcomes similar to the example given in the previous section.[9] In this example

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[8] For example, see Shulman [5]

[9] This section draws on Tan [12]

we assume that the expected LC:$ rate, .09167 to 1 is the appropriate "smart" budgeting rate.

The manager faces three possible transactions which are not mutually exclusive. This example is complex, since the $ profit computations involve asset adjustments as well as operating profits. We shall assume that the accounting data of a foreign responsibility center are translated from local currency into the parent company's currency according to the monetary/non-monetary method.[10]

Three operating plans are considered. One involves sales of LC 80,000 and requires LC 75,000 of exposed assets, the second gives sales of LC 100,000 but requires LC 100,000 of the exposed assets and the third gives sales of LC 150,000 but requires LC 200,000 of exposed assets. The remaining details of each plan, as well as their budgeted performance using each of the possible exchange rates are shown in Table 1. Note that for simplicity, we assume changes in the exchange rate would have no impact on LC operating results.

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10 The four foreign currency translation methods in use or being advocated are:

- the current/non-current method
- the monetary/non-monetary method
- the temporal method
- the current rate method

Each are discussed in detail in AICPA [1]. We are not advocating any particular method, although we do believe the monetary/non-monetary method is the most sensible of the two methods in regular use.

"Under this method, monetary assets and liabilities are translated at the current exchange rate. Monetary assets and liabilities are defined as items which represent the right to receive (or the obligation to pay) a fixed number of foreign currency units (cash, accounts receivable, accounts payable, borrowed funds, etc.). Non-monetary assets and liabilities are translated at the exchange rate which prevailed at the date of acquisition or commitment." Barrett [2], p. 5.

Table 1

BUDGETED PROFIT PERFORMANCE AT DIFFERENT EXCHANGE RATES

Budget in LC terms	Operating Plan A	Operating Plan B	Operating Plan C
Sales	LC 80,000	LC 100,000	LC 150,000
COGS	LC 60,000	LC 80,000	LC 125,000
OPX	LC 4,000	LC 5,000	LC 7,500
Profit	LC 16,000	LC 15,000	LC 17,500
		(taxes ignored for simplicity)	
Budgeted Margin	+ 20%	+15%	+11.7%
at existing LC.1: $ rate			
Sales	$8,000	$10,000	$15,000
COGS	$6,000	$ 8,000	$12,500
OPX	$ 400	$ 500	750
Profit	$1,600	$ 1,500	$ 1,750
Budgeted Margin	+20%	+15%	+11.7%
at "budgeting rate" LC .09167: $1			
Sales	$7,332	$ 9,166	$13,749
COGS	$5,499	$ 7,333	$11,457
OPX	$ 367	$ 458	$ 687
*Loss on exposed assets	$ 626	$ 834	$ 1,688
Profit	$ 840	$ 541	$ -67
Budgeted Margin	+ 11.5%	+5.8%	-.5%
at 12.1 rate (if budget contingent on actual outcome)			
Sales	$6,664	$ 8,333	$12,500
COGS	$4,998	$ 6,667	$10,417
OPX	$ 333	$ 417	$ 625
X Loss	$1,250	$ 1,667	$ 3,334
Profit	$ 83	$ -418	$-1,876
Budgeted Margin	1.2%	-5.0%	-15%

*Exposed assets, with monetary/non monetary distinction, are the excess of cash and LC receivables and other financial assets over all forms of LC obligations. Assume LC 75,000 for Plan A = LC 100,000 for Plan B, LC 200,000 for Plan C.

It is easy to see how the treatment of foreign exchange fluctuations will affect a manager's reported profit and therefore his incentives. If foreign exchange fluctuations are considered to be outside of the realm of the operating manager, the results will be recorded as if the ending exchange rate is .1:1 (or a similar effect will be obtained by altering the budgeting performance standard to reflect the actual outcome) and all three transactions will be profitable, including C which clearly should be avoided. If all exchange fluctuations are imposed on the manager, on the other hand, he will probably avoid B as well as C, because of the possibility of a loss. Only if the manager's reported profit is based on the budgeting rate , in this case the expected rate .09167:1, will he make appropriate decisions--namely, accepting A and B and avoiding C. In this fashion, he would be held responsible for decisions consistent with the best available forecast of exchange rates, but would not be penalized for further fluctuations (or rewarded if these did not take place).

Let us now turn to the question of what exchange rate should be used when tracking actual performance, given that one of the three exchange rate types has been chosen for budget preparation.

The various budget-rate/tracking-rate combinations are illustrated in Table 2. Combinations marked N.A. are judged to be inefficient because they involve more effort than other options which are clearly superior and therefore are not considered. Note that all combinations along the diagonal, i.e., where both budgeting and tracking use the same type of rates, produce no deviations due to exchange rate variations. However, they do have quite different implications in terms of the budgeting process itself. Both historical rate and actual rate budgets, the latter requiring a budget adjustment for every exchange rate change, ignore the possible impacts of exchange rates

Table 2

BUDGET VS "TRACKING" PERFORMANCE OF PROFITS EXAMPLE WITH ALTERNATIVE METHODS

Rate used on determining budget	Rate used for translation/ "tracking"	Actual Rate		Historical Rate		Budgeting Rate	
		Outcome 10:1	Outcome 12:1	Outcome 10:1	Outcome 12:1	Outcome 10:1	Outcome 12:1
Actual LC.1:$1 or LC.0833:$1							
Plan A	Profit	1,600	83				
	Budget	1,600	83	N.A.		N.A.	
	Deviation						
Plan B	Profit	1,500	-418	N.A.		N.A.	
	Budget	1,500	-418				
	Deviation						
Plan C	Profit	1,750	-1876				
	Budget	1,750	-1876	N.A.		N.A.	
	Deviation						
Historical LC.1:$1							
Plan A	Profit	1,600	83	1,600	1,600	N.A.	
	Budget	1,600	1,600	1,600	1,600		
	Deviation						
Plan B	Profit	1,500	-418	1,500	1,500		
	Budget	1,500	1,500	1,500	1,500	N.A.	
	Deviation		-1,919				
Plan C	Profit	1,750	-1,876	1,750	1,750		
	Budget	1,750	1,750	-1,750	1,750	N.A.	
	Deviation		-3,626				
Budgeting LC.09167:$1							
Plan A	Profit	1,600	83			840	83
	Budget	840	840	N.A.		840	83
	Deviation	+760	-757				
Plan B	Profit	1,500	-418			541	-418
	Budget	541	541			541	-418
	Deviation	+959	-959	N.A.			
Plan C	Profit	1,750	-1876			-67	-1876
	Budget	-67	-67	N.A.		-67	-1876
	Deviation	+1813	-1813				

on the firm and therefore, make plan C appear acceptable. The "smart" budgeting rate diagonal combination, on the other hand, isolates managers from unplanned exchange fluctuations but acknowledges the impact of the anticipated fluctuations at the budgeting stage.

The combination of historical rates for budgeting and actual rates for tracking appears to represent the worst of all worlds, although it probably is widely used. The budgeting process takes no account of possible exchange fluctuations, yet their full impact is attributed to the manager at the tracking stage. The harmful effects of such a system can be expected to include padding of budgets or decentralized hedging actions by managers to reduce exchange risks which loem very large from their local perspective, and numerous sources of noise and bias in tracking comparisons. The one remaining combination, "smart" budgeting rates with tracking at the actual rate, imposes foreign exchange related income fluctuations on the operating manager, but at least it forces their consideration at the budgeting stage. It thus seems clear that, (a) a "smart" budgetary rate is superior to other alternatives, and that, (b) tracking rate matching the budget rate appears to be the best.

Some Implementation Issues

The mechanics of determining the "smart" budgeting rates become significant. Who should set the rates? The most important consideration here should be to incorporate all relevant information available from inside and outside sources.

An honored convention for minimizing disfunctionalities in control systems is that affected management should have a say in the negotiation of any performance budget relevant to his own unit. This is to ensure a thorough understanding of the reasonableness of a budget is achieved, and, consequently, to enhance confidence and commitment to the system. This implies that local management must agree on the "smart" budget rates and feel comfortable about them. Typically outside as well as headquarter currency experts will have a major influence on the rate determination. The local manager must, however, be heard.

Two mechanisms should be instituted in order to improve confidence in the system:

- a mechanism for appealing unacceptable "smart" budgeting rates to a higher level of management.
- a mechanism for revising the "smart" budgeting rates in those circumstances where completely unforeseen events dramatically change the exchange rate.

We have avoided the question of whether the budgeting rates should be adjusted continuously or periodically. However, just as with any other plan or budget, these rates can be revised to reflect major shifts in the financial environment.

Conclusions

We have developed an approach for a class of the multinational corporation's decision support systems which incorporates management control over operating decisions, undertaken fairly autonomously by each individual foreign subsidiary, and international funds management undertaken primarily by a

headquarters office. A set of currency rates which reflect the best judgement of the currency developments by those involved, called "smart" budgeting rates, were developed to be the basis for the budgets. Local management were expected to take actions on the basis of these rates and to be held responsible for their performances relative to these rates. We feel this approach offers an operational mechanism to effectively cope with the foriegn currency fluctuation problem while maintaining a decentralized management control system.

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